

Union Calendar No. 196

111TH CONGRESS
1ST SESSION

H. R. 3029

[Report No. 111-343]

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle power generation systems.

IN THE HOUSE OF REPRESENTATIVES

JUNE 24, 2009

Mr. TONKO introduced the following bill; which was referred to the Committee on Science and Technology

DECEMBER 1, 2009

Additional sponsor: Mr. INGLIS

DECEMBER 1, 2009

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italie*]

A BILL

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle power generation systems.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. HIGH EFFICIENCY GAS TURBINES.**

4 (a) ~~IN GENERAL.~~—The Secretary of Energy shall
5 carry out a multiyear, multiphase program of research, de-
6 velopment, and technology demonstration to improve the
7 efficiency of gas turbines used in combined cycle power
8 generation systems and to identify the technologies that
9 ultimately will lead to gas turbine combined cycle effi-
10 ciency of 65 percent.

11 (b) ~~PROGRAM ELEMENTS.~~—The program under this
12 section shall—

13 (1) ~~support first-of-a-kind engineering and de-~~
14 tailed gas turbine design for utility-scale electric
15 power generation, including—

16 (A) ~~high temperature materials, including~~
17 superalloys, coatings, and ceramics;

18 (B) ~~improved heat transfer capability;~~

19 (C) ~~manufacturing technology required to~~
20 construct complex three-dimensional geometry
21 parts with improved aerodynamic capability;

22 (D) ~~combustion technology to produce~~
23 higher firing temperature while lowering nitro-
24 gen oxide and carbon monoxide emissions per
25 unit of output;

1 (E) advanced controls and systems integra-
2 tion;

3 (F) advanced high performance compressor
4 technology; and

5 (G) validation facilities for the testing of
6 components and subsystems;

7 (2) include technology demonstration through
8 component testing, subscale testing, and full scale
9 testing in existing fleets;

10 (3) include field demonstrations of the devel-
11 oped technology elements so as to demonstrate tech-
12 nical and economic feasibility; and

13 (4) assess overall combined cycle system per-
14 formance.

15 (c) PROGRAM GOALS.—The goals of the multiphase
16 program established under subsection (a) shall be—

17 (1) in phase I—

18 (A) to develop the conceptual design of ad-
19 vanced high efficiency gas turbines that can
20 achieve at least 62 percent combined cycle effi-
21 ciency on a lower heating value basis; and

22 (B) to develop and demonstrate the tech-
23 nology required for advanced high efficiency gas
24 turbines that can achieve at least 62 percent

1 combined cycle efficiency on a lower heating
 2 value basis; and

3 ~~(2) in phase II, to develop the conceptual de-~~
 4 ~~sign for advanced high efficiency gas turbines that~~
 5 ~~can achieve at least 65 percent combined cycle effi-~~
 6 ~~ciency on a lower heating value basis.~~

7 (d) PROPOSALS.—Within 180 days after the date of
 8 enactment of this section, the Secretary shall solicit pro-
 9 posals for conducting activities under this section. In se-
 10 lecting proposals, the Secretary shall emphasize—

11 (1) the extent to which the proposal will stimu-
 12 late the creation or increased retention of jobs in the
 13 United States; and

14 (2) the extent to which the proposal will pro-
 15 mote and enhance United States technology leader-
 16 ship.

17 (e) COST SHARING.—Section 988 of the Energy Pol-
 18 icy Act of 2005 (42 U.S.C. 16352) shall apply to an award
 19 of financial assistance made under this section.

20 (f) LIMITS ON PARTICIPATION.—The limits on par-
 21 ticipation applicable under section 999E of the Energy
 22 Policy Act of 2005 (42 U.S.C. 16375) shall apply to finan-
 23 cial assistance awarded under this section.

24 (g) AUTHORIZATION OF APPROPRIATIONS.—There
 25 are authorized to be appropriated to the Secretary for ear-

1 rying out this section \$65,000,000 for each of fiscal years
 2 2011 through 2014.

3 **SECTION 1. HIGH EFFICIENCY GAS TURBINES.**

4 (a) *IN GENERAL.*—The Secretary of Energy shall
 5 carry out a multiyear, multiphase program of research, de-
 6 velopment, and technology demonstration to improve the ef-
 7 ficiency of gas turbines used in combined cycle power gen-
 8 eration systems and to identify the technologies that ulti-
 9 mately will lead to gas turbine combined cycle efficiency
 10 of 65 percent.

11 (b) *PROGRAM ELEMENTS.*—The program under this
 12 section shall—

13 (1) support first-of-a-kind engineering and de-
 14 tailed gas turbine design for megawatt-scale and util-
 15 ity-scale electric power generation, including—

16 (A) high temperature materials, including
 17 superalloys, coatings, and ceramics;

18 (B) improved heat transfer capability;

19 (C) manufacturing technology required to
 20 construct complex three-dimensional geometry
 21 parts with improved aerodynamic capability;

22 (D) combustion technology to produce high-
 23 er firing temperature while lowering nitrogen
 24 oxide and carbon monoxide emissions per unit of
 25 output;

1 (E) advanced controls and systems integra-
2 tion;

3 (F) advanced high performance compressor
4 technology; and

5 (G) validation facilities for the testing of
6 components and subsystems;

7 (2) include technology demonstration through
8 component testing, subscale testing, and full scale test-
9 ing in existing fleets;

10 (3) include field demonstrations of the developed
11 technology elements so as to demonstrate technical
12 and economic feasibility; and

13 (4) assess overall combined cycle system perform-
14 ance.

15 (c) *PROGRAM GOALS.*—The goals of the multiphase
16 program established under subsection (a) shall be—

17 (1) in phase I—

18 (A) to develop the conceptual design of ad-
19 vanced high efficiency gas turbines that can
20 achieve at least 62 percent combined cycle effi-
21 ciency on a lower heating value basis; and

22 (B) to develop and demonstrate the tech-
23 nology required for advanced high efficiency gas
24 turbines that can achieve at least 62 percent

1 *combined cycle efficiency on a lower heating*
2 *value basis; and*

3 *(2) in phase II, to develop the conceptual design*
4 *for advanced high efficiency gas turbines that can*
5 *achieve at least 65 percent combined cycle efficiency*
6 *on a lower heating value basis.*

7 *(d) PROPOSALS.—Within 180 days after the date of*
8 *enactment of this Act, the Secretary shall solicit grant and*
9 *contract proposals from industry, universities, and other*
10 *appropriate parties for conducting activities under this Act.*
11 *In selecting proposals, the Secretary shall emphasize—*

12 *(1) the extent to which the proposal will stimu-*
13 *late the creation or increased retention of jobs in the*
14 *United States; and*

15 *(2) the extent to which the proposal will promote*
16 *and enhance United States technology leadership.*

17 *(e) COMPETITIVE AWARDS.—The provision of funding*
18 *under this section shall be on a competitive basis with an*
19 *emphasis on technical merit.*

20 *(f) COST SHARING.—Section 988 of the Energy Policy*
21 *Act of 2005 (42 U.S.C. 16352) shall apply to an award*
22 *of financial assistance made under this section.*

23 *(g) LIMITS ON PARTICIPATION.—The limits on partici-*
24 *pation applicable under section 999E of the Energy Policy*

1 *Act of 2005 (42 U.S.C. 16375) shall apply to financial as-*
2 *sistance awarded under this section.*

3 *(h) AUTHORIZATION OF APPROPRIATIONS.—There are*
4 *authorized to be appropriated to the Secretary for carrying*
5 *out this section \$65,000,000 for each of fiscal years 2011*
6 *through 2014.*

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